



Canadian Centre for Occupational Health and Safety

Centre canadien d'hygiène et de sécurité au travail



**OCCUPATIONAL
HEALTH AND SAFETY
ISSUES IN WASTE
MANAGEMENT**

A Seminar

P92-3E

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**Canadian Centre
for Occupational Health and Safety**

OCCUPATIONAL HEALTH AND SAFETY ISSUES IN WASTE MANAGEMENT

A Seminar

**Wednesday, May 15, 1991
Sheraton Hamilton Hotel, Hamilton, Ontario**

8:15 am REGISTRATION AND COFFEE

9:00 am Welcome and Introduction to the Seminar
Lillian Vine, Manager, Workshops and Conferences
Canadian Centre for Occupational Health & Safety

Safety Issues In Solid Waste Management
Jack Bedggood, Safety Manager
Laidlaw Environmental Services Limited

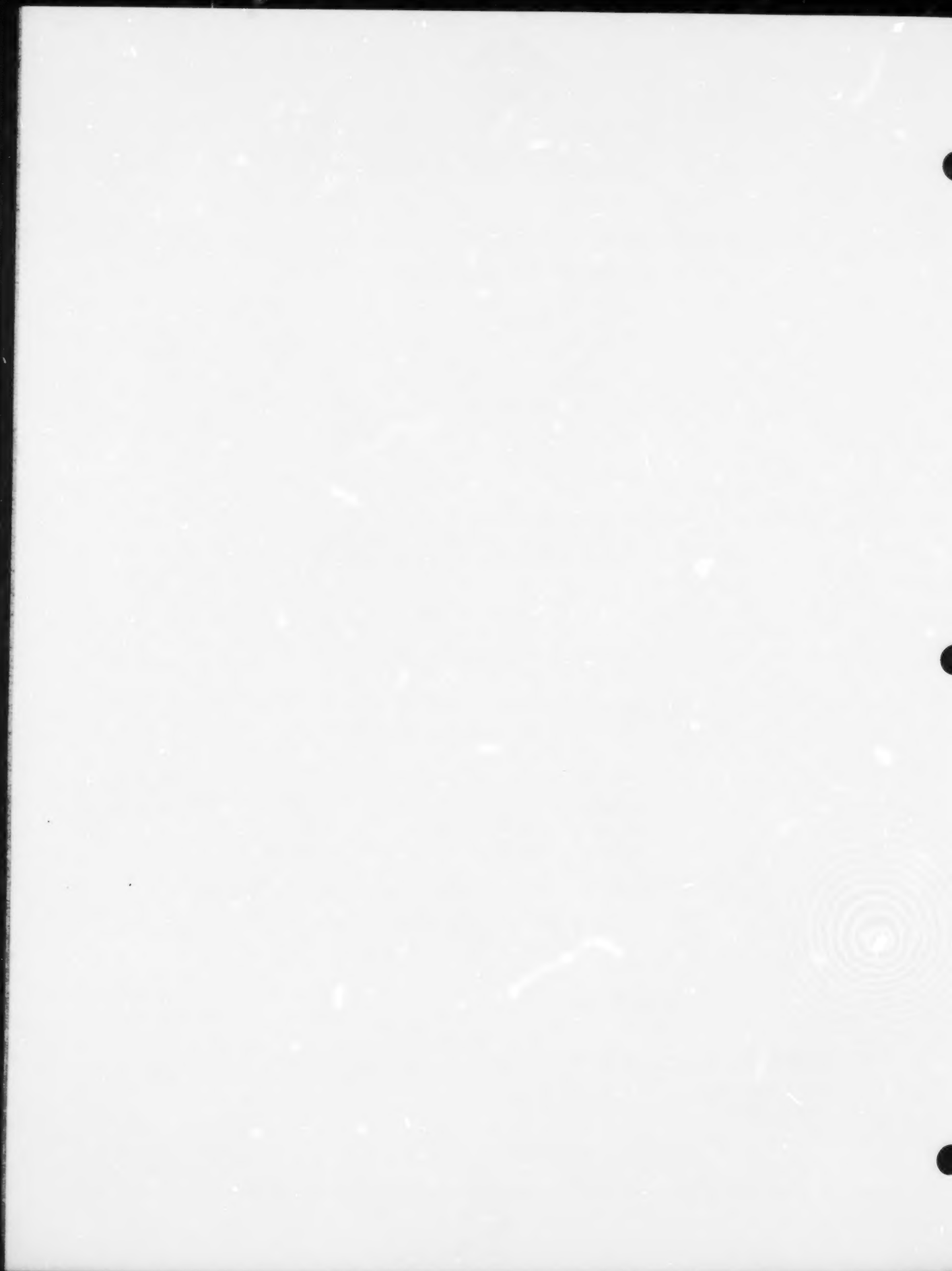
Health Care Facilities
Richard Blais, Director Occupational Safety
Victoria Hospital

Oil Recycling
Fred Rehn, Safety Coordinator
Breslube, Division of Safety-Kleen Canada Inc

**Occupational Health and Safety Implications for Emergency
Workers**
Doug Johnstone, Acting District Chief
Hamilton Fire Department

Open Discussion

12:00 n CLOSE OF SEMINAR



INTRODUCTION

Lillian Vine

I am Lillian Vine, Manager of Workshops and Conferences for the Canadian Centre for Occupational Health and Safety. I am delighted that you are here today for our seminar in Occupational Health and Safety Issues in Waste Management.

Besides a very fine audience and some very fine speakers, we have with us the man who started our workshop program. Martin O'Connell is the former Chairman of the Council of Governors of the Canadian Centre for Occupational Health and Safety, and it was his idea to start a workshop program which has become very successful. Welcome Martin, I am pleased that you are here.

Among our speakers are some old friends and others that we hope will become old friends. Richard Blais is a former staff member of the Centre; Jack Bedggood has been a participant, a presenter and a supporter of our workshop program.

Before I introduce each of our speakers, I would like to express our gratitude for their presence at this seminar, not only because they are very good, but also because of the tremendous contribution they make to the CCOHS workshop program. We ask them to prepare a speech. We ask them to meet with me at 7:30 in the morning. We ask them to prepare very brief biographical notes which I sometimes shorten even more when I introduce them. We ask them to speak for much too short a time so that there is time for your questions, your discussion, and your comments. And we ask them to pay their own expenses to get here and we don't pay for their time. What do we offer them in return? We thank them profoundly. We are deeply grateful. And we remain friends so we may ask them again.

SAFETY ISSUES IN SOLID WASTE MANAGEMENT

Lillian Vine

Our first speaker is Jack Bedggood. Jack holds a Bachelor's degree in Engineering Science, Chemical Engineering from the University of Western Ontario. He is a registered professional engineer with the Association of Professional Engineers of Ontario; a Certified Safety Professional with the Board of Certified Safety Professionals of the Americas; a member of the Canadian Society of Safety Engineering; a member of the Canadian Fire Safety Association; and an honorary life member of the Industrial Accident Prevention Association of Ontario. He is active with the Canadian Standards Association Standards Steering Committee on Occupational Health and Safety and the Canadian Manufacturers' Association Occupational Health and Safety, and Workers' Compensation Committees. He is active in occupational health and safety on a full-time basis and has been since 1967 in the chemical industry with DuPont, the trucking industry with CP Trucks, and now with Laidlaw in waste management services. He is Corporate Manager, Safety and Occupational Health, Laidlaw Environmental Services Limited.

Jack Bedggood

Laidlaw Environmental Services Limited (LESL) came into being on January 1, 1990, and was publicly proclaimed under that new corporate name on April 17, 1990. It was the result of the acquisition and merger of five hazardous waste service businesses by our parent company, Laidlaw Inc. In our first year we have added



three more acquisitions and are now operating in four provinces with more growth planned. Our workforce totals approximately 630, 80% of whom were with one of five original acquisitions which has been in this business since 1972.

Our business can best be defined as environmental liability management of hazardous chemical wastes through the application of numerous treatment technologies, including high temperature incineration, physical/chemical neutralization and stabilization, bulking and blending for recycling, and secure landfilling. In addition, we provide on-site remedial clean-up and restoration services, and we are the market leader in providing household hazardous waste collection programs. If you have a barrel of "gunk" or many barrels of "gunk" in the back of your plant site for which you fear the Ministry of the Environment (MOE) or some other environmental watchdog is going to challenge your sincerity for being corporately green, give us a call and we'll help ensure that doesn't happen. That is the end of the commercial.

I want you to recognize that the safety issues in waste management that I shall discuss come from the perspective of an accident prevention consultant trying to help a newly formed team of differing experience and management styles in the rather short time frame of its first year of existence, and further, that it is with that sector of the waste management business that deals with hazardous chemicals.

How does one come to grips with the safety issues, and what did I do to define the safety needs when I joined LESL last year? Like any good safety man, I went after the injury statistics. But there's a difference. In the Laidlaw family of companies, the fiscal year ends August 31. Here is the first year's results, albeit for only 8 months: 22 serious injuries, lost time or restricted work cases with 68% being soft tissue injuries (sprains/strains). On a frequency basis our lost-time injury rate was 3.6 (on a 200,000 hour exposure basis). This compares with the Ontario trucking industry's 11.8 (as published by TSA for rate 656, the group in which the WCB currently places our company).

However, while sprains/strains were the most prevalent consequence (and we have highlighted awareness promotions to address this issue with our employees), examination of the injury causing incidents, the manner in which they were managed and the circumstances surrounding them revealed the basic needs or issues were parallel to those I had seen in the past in the solid waste management business as well. Sprains/strains also accounted for two-thirds of the serious injuries in the solid waste management business mainly because of the classical causes of improper materials handling such as lifting and twisting, over-exertion reaction, and slips and falls.

These underlying issues can be summarized as:

- Inadequate management of safety skills
- Lack of supervisory awareness of the importance for operating safely
- Inadequate support and understanding by employees of an Occupational Health and Safety policy

The consequence of these deficiencies can be recognized in such occurrences as:

- Late reporting of injury-causing events by employees
- Missed utilization of alternate or modified duties
- Superficial investigation of incidents and inadequate remedial actions
- Missing written safe operating rules and procedures
- Reoccurrences
- Lack of effective work practices auditing



It is one thing to identify what you think the issues may be, but quite another to implement measures to deal with those issues and then be satisfied that you are on the right path. While our position on the learning curve is still relatively short, our initial experience is encouraging. As of the end of April, the first 8 months of fiscal 1991, our loss-time (LT) rate is 0.8, 75% lower than last year. For those of you who monitor total recordables, our year-over-year improvement is more modest at 10%.

Let me share with you some of the measures I believe have brought about these initial gains and which I believe are essential for dealing with the issues I have identified. In summary these are:

1. Formal safety management training
2. Supervisory/team building skills training
3. Safety and Health Program Manual issuing
4. Internal total environmental risk auditing
5. Safety and Health policy promoting

A few comments about each of these is needed to clarify what they entail.

You might have anticipated that one of the issues I would identify was the often cited need for top management support. While this factor is certainly essential, it is not an issue; for me it is a given. The five measures I have just cited can only be addressed with support from top management. I do not have to convince senior management in my company of the need to spend money for Health and Safety needs. They already see this as not an operating expense but a sound investment with high returns. To illustrate, let me quote our President, Charles Lalonde. In a letter to a new member of management with the Company, who had been the previous owner of an acquired company, Chuck wrote, "We put safety ahead of all other business issues. It is part of the way we want to build strong values...safety is of prime importance to me."

The first measure is formal safety management training. For every member of line supervision this means three days away from the plant in an interactive workshop/seminar of 18-20 people from various Company locations. We use the International Loss Control Institute (ILCI) Modern Safety Management curriculum and course facilitators. It gives our managers a good grasp of the principles of loss control and a lot of practical how-to's they can and do make use of. It makes real the belief we share that safety and health can and must be managed, and it puts everyone on the same basis.

Supervisory and team building skills training is a parallel program using the same format--in-house sessions led by a human resources consulting group. This training is helping us develop the trust, cooperation, commitment and problem-solving approach among all employees that I believe is fundamental to achieving improvement in health and safety performance.

The third measure is the issuing of the Safety and Health Program manual. This is a Corporate manual we issued early last year which is still growing, as it will over time, as we put in place the guidelines, standards, rules, procedures and safe practices that we need. The purpose of this manual is, as the preface says to the line manager, "...to ensure consistent practices across the Company where required and permit variations where warranted and to assist in training and orientation for all employees." Some of its initial contents provided incident-reporting requirements, a team investigation protocol, and the Safety and Health policy.

The internal total environmental risk auditing program is a "SWAT" team that gets called out before there is trouble. This audit is primarily driven by our mission to provide environmental liability management service, and it focuses on the technical and procedural infrastructure underlying regulatory compliance to ensure that we minimize the potential liability exposure. Our audit team is made up of five people with expertise in environmental issues, health and safety, engineering, transportation and operations. The end result of the audit



is a "blueprint" that the facility manager can use for planning in the year ahead. Some of you are familiar with chemical industry initiatives; this program is modelled after the "Responsible Care" program developed by the Canadian Chemical Producers' Association (CCPA).

The fifth and last measure used to deal with the issues in waste management is the cornerstone. As those of you from Ontario know, our Safety and Health Act had some major changes come into effect this year under Bill 208. In an eight-page supplement to The Financial Post on March 19, 1991, the lead-off article noted that three significant changes were introduced in the Bill: "a) vests real ownership in health and safety by management and labour; b) introduces tremendous commitment to training; and, c) requires Joint Health and Safety Committees to another 30,000 workplaces."

While I do not disagree that these are significant changes, I believe another change introduced by Bill 208 is far more important in dealing with the Safety and Health issues, not only in the waste management industry, but in all workplaces, and that is Section 14 (2) (i) of the Act which reads: "...an employer shall prepare and review, at least annually, a written Occupational Health and Safety policy and develop and maintain a program to implement that policy."

It was a conscious decision by our President to sign and proclaim to all employees, our customers and the public our Corporate Policy on Health and Safety on the day our new identity was declared. In this first year, and probably in the future, I have spent, and will spend, more time with employees at all levels promoting a fuller understanding and commitment to these words, the fifth measure to deal with the issues. This policy statement was drafted in 1988 by a cross-section of line and staff managers and today it is displayed in the lobby of all our facilities and in other on-site locations such as lunchrooms, training rooms and conference rooms. It is a key component of our new employee orientation program.

The first section in the Corporate Safety and Health Program manual sets out this policy and provides a rationale and the implications of the statements to help managers and employees see its importance as the foundational support and reason for all Safety and Health program elements and activities. It defines what we mean when we say "Laidlaw," "committed," "subscribes," "all"--especially "all." It is essential for each employee to personally believe that s/he can do his/her job without accident or injury--ever.

Another measure we have developed and introduced in addition to the five I itemized was in response to employee teams who have made the prevention of all injuries a reality. It is a corporate award which we call the "SAFER" program--the Safety and Health Award For Excellence Recognition. We define excellence as "all employees included in an award group who complete 12 consecutive months without any serious injury or occupational illness" (without a Lost Work Case or Restricted Work Case as classified by the Bureau of Labour Standards guideline). This recognition is from and by senior management and six of our locations achieved the charter awards last month.

Ladies and Gentlemen, I realize that I have taken a rather small sampling of the total waste management industry to identify its safety issues, but I trust these shared thoughts and experiences will be helpful to you in dealing with the safety issues in the part of the waste management business that you face.

QUESTIONS AND DISCUSSION

Nadia Hawkins - Ontario Ministry of Labour

I am interested in your accident statistics. Do they also indicate occupational illness?



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Jack Bedggood

If they occur, yes. We haven't had an occupational illness but we have not been in business long.

Nadia Hawkins

We are concerned in the Ministry about respiratory problems, dermatitis, skin rashes, and chemical splashes.

Jack Bedggood

We have had some chemical splashes but they were not serious.

Nadia Hawkins

So I take it then that you have the training and protective clothing in place?

Jack Bedggood

Yes, that is a given.

Nadia Hawkins

So it is not a major component of your accidents?

Jack Bedggood

No.

Martin O'Connell - Labourers' Health and Safety Fund of North America

I would like to ask Jack whether he sees any need for medical surveillance of workers in the hazardous waste industry from the perspective of the experience at Laidlaw. I ask that partly in the larger frame of Canada's green program's obvious intention over the next five years to clean up sites. This is in addition to hauling waste to various places. Do the rather unusable aspects of waste management and liabilities justify, in your view, medical surveillance?

Jack Bedggood

Indeed, medical surveillance of employees is certainly a part of our approach to total risk control. We do a pre-placement at the time of hire and for those who are exposed to hazardous waste, including heavy metals, there is a heavy metals analysis and ongoing supplementary medicals.

HEALTH CARE FACILITIES

Lillian Vine

The next issue we approach is Health Care Facilities. We found many concerns in that industry; in particular, people are concerned about the handling of medical wastes and infectious materials. When I called Richard



Blais, he was especially pleased to accept because he had been involved in developing a policy at the Victoria Hospital.

Richard Blais is the Director of Occupational Safety at Victoria Hospital, an 850-bed hospital in London, Ontario. Prior to this, Richard was Manager of Occupational Health and Safety for Reinhold Limited, a chemical company. He has also worked as a Project Officer for the Canadian Centre for Occupational Health and Safety and an Occupational Health Officer for the City of Ottawa. He brings with him an Industrial Hygiene and Occupational Safety background.

Richard became extensively involved in waste management at the hospital primarily by accident. Following several incidents reported by hospital staff, Richard was asked to review the waste management practices at the hospital and make recommendations to improve it.

Richard Blais

I am going to give you a brief overview of our hospital complex, list briefly the legislation and guidelines pertaining to hazardous waste, provide you with the classification scheme that we used to classify the waste in our facilities, the hazards associated with that waste, a summary of some of the concerns that we identified during our study, and finally the action we took to rectify these concerns.

Victoria Hospital is a very large hospital. It consists of two buildings with about 400 beds in each facility. We have over 4,500 employees at the hospital. Our primary areas of focus are Cardiac and Vascular Services, Specified Children Services, Critical Care Services, and Specified Oncology Services. We are also a major centre for health care research.

I got into the hazardous waste picture by accident when I was asked to review the procedures. The first thing I decided to do was look at the Legislation, the standards and guidelines and review these documents and our current practices. I would then review the areas in which we were deficient, if we were deficient at all.

Here is a brief summary of some of the legislation and guidelines that pertain to the handling and disposal of hazardous waste. Regulation 309 under the Environmental Protection Act regulates waste disposal in the province of Ontario. Regulation 1182 is a PCB Regulation which regulates the storage and disposal of PCB Waste. The Transportation of Dangerous Goods Act (TDG) regulates the transportation of hazardous waste. The Occupational Health and Safety Act requires that staff handling waste be properly trained and be aware of the hazards associated with waste through WHMIS Legislation and all the other regulations under the Occupational Health and Safety Act. The Atomic Energy Control Act regulates the disposal of radioactive waste. The Dead Animal Disposal Act regulates the disposal of dead animals which is also regulated by the Ministry of Agriculture. Municipal By-Laws regulate the disposal of waste in landfills as well as through the sanitary sewer systems.

The standards and guidelines that provide information on hazardous waste include:

- CSAZ 317.10-88 is a CSAZ guideline which was prepared to provide information for health care facilities in the handling and disposal of wastes.
- The Ontario Hospital Association through the Health Care Occupational Health and Safety Association prepared a guide on the proper handling and disposal of sharps.
- The Canadian Society of Hospital Pharmacists prepared a guideline for the handling and disposal of hazardous pharmaceuticals.



- The Ministry of the Environment in Ontario prepared guidelines for the handling and disposal of biomedical waste from Health Care Facilities and Laboratories.

It took me a long time to review these documents. I was also fortunate to come across another paper that provided some information on how to go about doing a waste management review as well as implementing a waste management procedure. Basically the summary of the document was that if you could answer all the following questions you would wind up with a comprehensive waste management program. The main areas of concern were:

- How do we identify what is hazardous and what is not?
- What other types of waste?
- Where can we dispose of them once we do identify the wastes that we have?

Although each guideline and piece of legislation may differ slightly in the classification scheme, I have come up with four main classes. They include: a) biomedical waste, b) chemical waste, c) radioactive waste; and, d) general waste. I will be describing those briefly during this presentation.

According to the Canadian Hospital Association "...the vast majority of health care waste is not hazardous and is general waste..." However, it is the other 10-15% that we do have a lot of concerns with and which has to be handled and disposed of appropriately.

The category of biomedical waste can be subdivided into three main areas: pathological waste, infectious non-anatomical waste, and sharps. Pathological waste includes human anatomical and infectious animal anatomical waste. Infectious non-anatomical waste can also have some subcategories including microbiology lab wastes that have not been decontaminated, waste from autopsies and surgeries, and waste from patients in isolation, and infectious anatomical waste if the patient happens to have a communicable disease. There have been a lot of studies about what is infectious and what is not; according to the Ministry of the Environment of Quebec, approximately 10% of hospital waste is infectious.

The third class in biomedical waste includes sharps. They can be defined as needles and syringes that have been used to administer drugs to patients, blades used in surgeries and autopsies, and broken clinical glass that is contaminated with blood or blood products.

We have subdivided the area of chemical waste into hazardous and non-hazardous chemical wastes, pharmaceutical wastes and other chemical wastes. WHMIS aside, the category of hazardous chemical wastes can be divided into four main classes: toxic, such as cyanide composite that may be found in a laboratory; corrosive, such as acids and caustics; flammable material, such as solvents; and reactive and explosive products, such as Picric acid and ethers which have been left on shelves for a long period of time and have developed peroxides.

Examples of non-hazardous chemical wastes include sugars, amino acids which are used in some of our clinical and research laboratories, organic and inorganic salts such as sodium benzoate, potassium chloride, and sodium chloride.

There are two main classes of pharmaceutical wastes--drug and medical chemicals that are no longer usable for patient treatment because they are past the expiry date; and cytotoxic wastes which are used in the treatment of cancer.

PCBs and asbestos have special requirements under the various legislations and guidelines. Some of the PCB wastes in our hospital are found in old transformers, some of which are still being used and some of which we



are going to retire soon. PCBs are contained in compositors from light ballasts in some of our light fixtures in the older facilities. Asbestos was used for insulation purposes years ago when we constructed our older facilities; because the facilities are old we do a lot of renovations and we generate a substantial amount of asbestos waste.

In the area of radioactive waste we are fortunate because the radioisotopes used have very short half-lives, which means that we usually allow them to decay to the point where they become non-radioactive prior to disposal. The waste disposal practices would depend on the other physical and/or chemical properties; for example, if a solvent that was used to carry the isotope is flammable and the radioisotopes have been decayed, the waste is disposed of as flammable liquid.

The bulk of the waste in health care facilities is general waste which includes office waste, kitchen waste, non-clinical glass waste, non-infectious non-anatomical waste which can include blood, blood products, bodily fluids and dressings from non-infectious wounds in patients, and confidential waste.

I have found a lot of discrepancies as to what is infectious and what is not, and this uncertainty has caused a lot of concerns and increased costs in the disposal of waste.

There are a number of health and safety concerns. There is a potential hazard with biomedical waste if it is infectious. Some of the infectious agents can include viruses, bacteria, and fungi. Just because there is an organism within a particular set of wastes does not necessarily mean that there is a hazard; there must be a method of transmission. Methods of transmission can be direct contact, usually person-to-person or patient-to-health-care worker; indirect contact, which involves the handling of the contaminated object; or airborne contact. There could be potential risk to staff if there are no proper handling, storage, or disposal practices within a facility. Some facilities have on-site incinerators which themselves create certain hazards. Practices are important; it is also important to have emergency procedures in the event of a spill so as not to predispose staff to certain health hazards.

The hazards associated with chemical waste depend on the physical properties of the product or the waste (whether it is a solid, a liquid or a gas, whether it is volatile or nonvolatile); the chemical properties (whether it is flammable, corrosive, reactive, explosive); the toxicological properties (whether it is toxic). Similarly to biomedical waste, are there proper handling, storage and disposal practices as well as emergency procedures in the event of a spill?

There are also hazards associated with general waste. We did a study for about six months in our kitchen area where some staff experienced back injury from handling kitchen waste. We found that the kitchen waste was put into plastic bags which were very heavy. Broken glass was put into non-solid containers and presented a hazard.

From our study, we found many concerns. The holding areas for biohazardous wastes were accessible to unauthorized personnel. The carts used to transport the waste were improperly designed and were not leak-proof; a leak within the container could cause a leak onto the floor. There was some confusion among staff about the segregation of the waste. In one instance, the waste was not properly stored. One problem we found was that the room where hazardous chemical waste was stored was not heated. Some of the waste was water-based and, because it was so cold, froze and broke the containers. Finally, we found that some of our sharps (needles, and syringes) were not disposed of in puncture-proof containers and were often found in the general waste containers. That resulted in needle-stick injuries. All of these problems could have been avoided if staff had been properly trained. I don't think that I can emphasize that enough.



It is getting increasingly difficult to identify what is hazardous and what is not hazardous in a health care facility. There are misconceptions within our facility as among the public as to what is hazardous waste especially in the area of biomedical waste.

- Improperly disposed waste can result in a perception of a potential problem.
- The difficulty in identifying what is hazardous and what is not has resulted in an increase of so called biomedical waste.
- It is costing substantially more money to dispose of the waste.

As a result of our study, the following actions have been taken: we have reviewed and rewritten our waste management procedures manual, and we are also in the process of implementing a training program for both the managers and the staff that have to handle the waste.

QUESTIONS AND DISCUSSION

Bernadette Stringer - Vancouver General Hospital

What do you do at your hospital with your cytotoxic cancer chemo waste?

Richard Blais

If it comes from the pharmacy, it goes into a container labelled "cytotoxic," then we package it into boxes to be shipped out by a waste disposal carrier for incineration.

Bernadette Stringer

You don't have an incinerator in your own facility?

Richard Blais

We had an incinerator but it was too old and the Ministry of the Environment asked us to shut it down.

Normand Belanger - Ottawa-Carleton French Language School Board

What is the frequency of your waste disposal from the hospital? What is the annual cost?

Richard Blais

For chemical waste, the cost is about \$40,000 a year, but there is the whole area of biomedical waste being handled by our housekeeping staff. The frequency for chemical waste disposal is about every month to six weeks, and for the biomedical waste it is twice a week.

Anne Monteath - Toronto Sick Children's Hospital

I empathise and I identify with many of your problems. One of the major problems that I have to deal with, given the philosophy of universal precautions, is the assumption that every blood or human specimen could be contaminated with blood or bodily fluids that could contain a blood-formed pathogen and therefore present potential transmission of infectious diseases. How do you identify your non-infectious non-anatomical waste?



Richard Blais

We leave it to the individual departments to make that judgment. It probably would not be safe for me to say all blood products are considered hazardous but I am pretty sure we are close to that as a result of that approach. We are inconsistent in what we tell the housekeeping staff when working with the patient to consider everything to be hazardous, and once the waste is picked up by them, we tell them that it is not. I think that confusion can be overcome through training, but the training has to be there. If everyone follows the procedures, I think the risks are substantially reduced.

Dave McNeaney - IAM, Local Lodge 863

Does each hospital have its own way of disposing of the waste? Isn't there a hospital association that can ensure that every hospital is following the same procedures? Doesn't anybody oversee the procedures?

Richard Blais

It is not quite that simple. The guidelines and the legislation are there. I think other than biomedical waste, the disposal practices are explicit. The area where we run into some difficulty is identifying what is infectious, which may be interpreted differently. But if it is biomedical waste or if it is infectious waste, unless a hospital has its own incinerator, I suspect the waste is being shipped to another site for incineration. If it is chemical waste, the facility would probably have a carrier which would ship it to an area for disposal. The PCB Regulations are quite explicit as to what you can and cannot do. The section in Regulation 309 on asbestos is also fairly explicit. It is only in the area of so-called "infectious waste" that there are grey areas. Once it is identified, the disposal practices are the same.

Dave McNeaney

That infectious waste gets picked up once or twice a week. Do you have a special storage area for it in the hospital?

Richard Blais

Yes we do. We also have segregated, well-managed storage areas for our waste.

Dave McNeaney

What about other medical facilities? We read about medical waste such as syringes that are washed up on the beach or found in a garbage bin. How does this happen if you have implemented procedures within your hospital and you have storage areas? How does this stuff get out of the hospital?

Richard Blais

Is has not happened at our hospital; I can't answer for the other hospitals.

Bernadette Stringer

I am an injection control nurse, so a lot of the concerns that have been discussed we have had as well. I work at Vancouver General Hospital which is larger than yours. We have about 1,000 patients. One concern has to do with what we consider to be infectious and what we consider to be non-infectious. The big problem is that



you have waste that would be considered biomedical waste being generated - say in doctors' offices - and unfortunately that has not been controlled very well. So you generate a lot of waste in those little places and there isn't good coordination. When you read stories about syringes washed up on beaches, this could be waste that is coming from those places that gets included in municipal waste where it should not be.

I think that the point to be made is this. In the community women menstruate, so there are soaked menstrual pads going into routine garbage that is sent to a landfill site and that's not a huge problem. Hospital waste isn't much worse than the waste that is generated in the community as a whole.

Dave McNeaney

I was just concerned that each department makes its own rules and they are not the same for each hospital. Within a company rules are the same for every department and nobody makes different rules.

Benedict Ssenyonjo - Princess Margaret Hospital

Each hospital is really an identity by itself but the guidelines are the same. I am just wondering what your findings are about biomedical waste? We at the Princess Margaret Hospital find that the volume and the cost are escalating.

Richard Blais

I don't have the figures but I know the increased costs in the last three years have been substantial. There is a problem with the public's perception that everything coming out of a hospital is dangerous. Perhaps if that could be overcome we could reduce costs.

Benedict Ssenyonjo

Do you have any ideas on how to reduce?

Richard Blais

No, but I hope it will not continue to increase. It depends on the carriers and the disposal procedures.

Dave Clark - Laidlaw Waste Systems

Being a member of labour on the front line, I have had a couple of experiences with one of the hospitals here in town. We quickly got in touch with the supervisors, and followed the chain of command through the procedures. Letters were submitted to the hospital and back down through the union, the committees, and everyone was given a clean bill of health. The system will work if everyone adheres to the system.

Laidlaw's health committees are setting up procedures now to handle problems that may arise. For example, if a worker develops a rash, it is reported and treated, and possible causes are examined. We are stepping in and really getting into worker safety. The system works and we are proud to see that it is working.



OIL RECYCLING

Lillian Vine

Fred Rehn graduated from Mohawk College's Process Operations course and first worked at Gulf Canada's Clarkson Refinery. He has been for some years with Breslube Enterprises as a Process Operator. His interest in Health and Safety was encouraged by the company Vice-President and the part-time position of Safety Coordinator became full time in the spring of 1988. Fred served as Chairman of the Kitchener Waterloo Section IAPA Executive Committee in 1989-90 and is presently a Director in the Chemical Industry's IAPA Class Association.

Fred Rehn

Everybody in this room generates waste oil. But I am only going to describe some of the problems associated with oil re-refining--both environmental problems and safety problems--and hopefully give you an idea of what we have done to control some of these problems successfully in the past.

Breslube is a recycler of used oil and North America's largest oil re-refiner. It's the fourth largest lube oil producer in Canada. Which is really saying a lot when you look at the types of businesses we are competing with--Exxon, Imperial Oil. We produce about 80 million lube products per year. Breslube started in 1977 with four employees and what they describe as "a dream." The original process was straight batch distillation using traditional methods and clay contacting. We have evolved since then. Today there are over 500 employees in Canada and the United States. Breslube has constructed a larger capacity oil recycling facility in East Chicago, Indiana, and has plans for another in Baltimore, Maryland, within the next couple of years. The production of the East Chicago facility alone will double that of the Breslau facility located outside of Kitchener, Ontario. New continuous processes include dehydration, vacuum distillation, and hydro treatment. Breslube's products include motor oils, journal oils, chain oils, diesel engine oils, hydraulic oils, rock drill oils, and fuel oils, and a by-product called asphalt extender. We are very proud of our product line which many of you may be using without realizing it. One of our promising new lines is the President's Choice Green Product line of environmentally sound oil, which is a recycled oil product. Breslube is also breaking new ground in its ethylene glycol recovery and recycling program.

Used oils are collected from garages, small or large industries, transport companies, car dealerships, airports and railways. Breslube collects from over 60,000 generators of used oil in Canada and the United States. I am quoting 1988 statistics; I am sure that number is substantially higher now.

The Breslau facility was purchased by Safety Kleen Corporation based in Chicago, Illinois, in 1989 to extend its existing fluid recovery and recycling processes. Safety Kleen produces all the solvent machines that are found in local garages and industries. Breslube is the North American headquarters for the oil divisions. The plant originated in Breslau, Ontario, and is the headquarters for it even though we are expanding into the United States. Safety Kleen has spent millions to upgrade the Breslube facility to hazardous-waste standards to protect the environment and to consolidate Breslube's position in the industry.

Breslube's mission is to recycle used oil into high quality oil products. We do this quite successfully. In 1989 about 880 million gallons of lubricating oil products were sold in the United States; 450 million gallons were collected and properly disposed of by methods like incineration and 100 million gallons were re-refined for greenhouse operations that use used oil for heating and maintaining plant growth. That leaves approximately 330 million gallons of used oil or waste oil lost to the environment. Of course, the implications of such a dramatic amount of oil going into the environment is obvious because of the types of contaminants that can be



found in used oils. Our hope is that used oil will be declared a hazardous waste to ensure its proper handling in the future. We are trying to prepare ourselves for this declaration.

Breslube's processes use up or deposit the byproducts into non-hazardous asphalt extender. The only byproduct from the original oil leaving the facility is water and it is biologically treated on site. Final treatment of the water as it is trucked from the site is performed at the Kitchener-Waterloo treatment plant. Along with all of the positives, Breslube also has had some negative connotations environmentally--oil and the sulphurous compounds found in oil smell. These products have very low odour thresholds and can create odours at very great distances from the plant. Part of Breslube's upgrade includes the fabrication and insulation of odour-suppressing filter canisters on the tops of the tanks. So far we have been very successful with this program and are continuing to upgrade in any way we can, but the odour still tends to be a bit of a problem and Kitchener-Waterloo is a very environmentally sensitive area in the Golden Triangle. We are presently installing an ozone generator which will be used to suppress odours in the biological water treatment process as part of our new technology going into odour control.

The petroleum industry alone has inherent health and safety concerns. Add to that the fact that feed stock is a waste product and these concerns can intensify. First let's discuss the feed stock. Used oil is naturally contaminated with engine metals, glycols, acids, and other combustion products, but it also can be contaminated with less than scrupulous methods with PCBs, solvents, and other hazardous materials. Breslube is licensed to handle only certain products and contaminants and to ensure the incoming oil meets licensing criteria and to minimize the acceptance of otherwise contaminated oil. The oil is sampled and analyzed when a new account is received and before off-loading into a guard tank. Nevertheless, some contaminated oil still slips past the testing process and must be dealt with appropriately. We presently have two tanks on our facility that are locked and chained because we have been stung. One of them was directly after the incident of a big PCB fire in Montreal. Shortly after that incident we received a load of very highly contaminated PCB oils.

Some of the intermediate processes products and byproducts are hazardous. For example: hydrogen, used in the hydro treater is extremely flammable; hydrogen sulphide gas found in the hydro treater is a deadly gas--persons subjected to as little as 1/10 of one percent or a thousand PBMs can immediately lose consciousness and die within three to four minutes. Hydrogen and hydrogen sulphide are contained within the process, however, in the event of an emergency, fixed and portable protection devices are used to detect leaks. Self-contained breathing apparatus is used in emergencies involving both hydrogen and H_2S . If we have a leak on the hydro treater unit, we always assume the worst and act accordingly.

Corrosives also present unique problems if released. Emergency equipment cabinets located throughout the facility contain chemical resistant clothing and other equipment necessary for spills and environmental releases. The processes used by Breslube are at elevated temperatures or pressures or both. This creates a potential fire hazard. A state-of-the-art foam fire/water system using sprinklers, hydrants and monitors aid in-plant and professional firefighters by being able to supply water or a 3% AFFF foam solution anywhere on the facility. Our refinery has probably the most up-to-date and state-of-the-art fire/water system and dislodge system anywhere in Ontario.

Welders are subjected not only to the normal array of metal fumes but also to fumes from exotic metals; and they sometimes work in confined spaces. The welding shop uses a local exhaust ventilation system, and respiratory protection and fresh air supply are provided for confined-space hot work. On the subject of hot work and confined space entry, all work performed by maintenance or contracted personnel is permitted, but the permitting procedure is very rigid by industry standards. Lock-out and take-out procedures are also adhered to for any work involving moving parts, electricity, or hazardous process flow. All testing, preparation requirements, authorization, and acceptance is recorded on a standard work permit form before any work can proceed.



Training plays an essential role in the health and safety program. Workers are trained about their jobs, emergencies, procedures, personal protection and safety equipment, environmental concerns, and other facets of their jobs as necessary for the health and safety training. One of my jobs is to pursue this health and safety training. We generally have two major training programs a month and this is supplemented by a weekly training topic program provided by a corporation in the United States. It is a unique system whereby our mother corporation introduces a weekly training topic to our facility and every week we have a supervisor stand in front of his/her employees and go over various parts of the program. These weekly training topics may be on respiratory protection, fall protection, or other topics not normally handled in a large training course. This way we hope to get the health and safety message as well as additional training.

All the loose ends in the health and safety program are tied together by a comprehensive written policy, program, and a company manual. Breslube has now gone fourteen months and has accumulated 350,000 person-hours without a lost-time accident. Our goal is to achieve one million person-hours with the continued support of our management and workforce. I am confident that this can be achieved.

QUESTIONS AND DISCUSSION

Joe Nazareth - Ontario Ministry of Government Services

How do you deal with PCB-contaminated oils? Do you store them separately or are you disposing of them?

Fred Rehn

We are not licensed to handle PCB-contaminated oil. We may handle up to 50 parts per million of contaminated oil. On top of that, we, like many other industrial settings in Ontario, have to isolate them accordingly, label them with the proper signage, and make it impossible to come in contact with the PCBs. As a point of interest, we have filed a written request to the Ministry of Environment to allow us to be able to run PCB-contaminated oil through our process. It is our belief that our hydro treater process will re-form the PCB molecules chemically and render them harmless. Up to now we have not been given permission, so we have to lock these tanks and isolate the areas.

Greg Jenish - Ontario Waste Management Corporation

Do you have a sampling or analysis program for waste arriving at your gate or do you rely on manifests?

Fred Rehn

We do both. Whenever we receive new clientele, we sample them immediately. That is a requirement before handling any new generator. Obviously with over 60,000 generators, it is impossible to sample every load that we pick up, so before a product is off-loaded from a trailer into one of our tanks we take a sample. Where they might slip through the web tends to be in the late hours of the night when we get something in from the southern United States or on the weekends when we get the odd batch of oil that is not properly sampled. Now 99 times out of 100 this doesn't present any problem, but that one time out of 100 we get stung.

Greg Jenish

Do you accept that waste on your property before sampling or analyzing?



Fred Rehn

Not generally, as I say, but there have been errors where we have received it without properly sampling it. In other words, the sample has been taken but not properly analyzed before off-loading. With the amount of truck traffic we have in the facility, we keep our lab staff hopping trying to keep the analysis up to date so that we can off-load in a timely fashion.

Normand Belanger - Ottawa-Carleton French Language School Board

Do you process a lot of oils from the States and if so what is the percentage?

Fred Rehn

I don't know the actual percentage. We have in the past done a lot of oils from the States but with our new facility in East Chicago, Indiana, which just came on-line last month and is not yet up to full production, all the American clientele will be handled through Indiana and in the future Baltimore when it comes on stream. Right now, all the Canadian clients will be directly handled through the Breslau facility.

Benedict Ssenyonjo

In the recycling process, what is the percentage of the oil that actually is put back into the market?

Fred Rehn

Well some of our contaminants can vary. One of the more problematic contaminants that we have is water, especially from garages and those type of accounts where we have a lot of water. Now if we exclude the water from the oils, the reclamation is very high. We are talking about 95% of the oil product that we have recycled being turned back into useable oil products, including fuel oil and asphalt extender. If we include the water as part of our feeds stock, it is substantially lower, probably 86%, because some of our oils are highly contaminated with water.

OCCUPATIONAL HEALTH AND SAFETY IMPLICATIONS FOR EMERGENCY WORKERS

Lillian Vine

Doug Johnstone, our next speaker, lives in Glanbrook. He joined the Hamilton Fire Department quite some time ago and was later promoted to the rank of Lieutenant. In 1986 he was promoted to the rank of Captain. He is a graduate of Mohawk College's Fire Sciences Program and of the Ontario Fire College in Gravenhurst. He is Acting District Chief presently assigned to the Kenilworth Avenue fire station.

Doug Johnstone

I do not intend to pinpoint the fire department's role in the topic of waste management, but, by giving you some insight into the concerns of the emergency services--the ambulances, police and fire departments--stress the importance of proper and legal waste management.



CCOHS/CCMST

In most occupations people are familiar with their surroundings, the materials relative to the job and the workplace. This is largely due to on-the-job training and WHMIS training programs. Firefighting is not a normal occupation and a firefighter's workplace is not just a fire station but the whole city in which he serves. To expect the firefighter to be familiar with every home, every building, and every yard in the city is expecting the impossible. However, with our educational programs and on-the-job training, we try to be prepared for almost any emergency.

Basic training for the new firefighter involves a nine-week training program. But training does not stop on the completion of the nine weeks. Training in the fire department is ongoing. There is training and drill conducted every day in every facet of firefighting and emergency operations. Part of our duties include home and commercial inspections. These are a three-fold program that we conduct to educate the home owner on safety and possible hazards in their home, to show industry and commercial ventures where they are in breach of agreement with the law, and to give the firefighter a chance to look around buildings that he does not usually see under normal conditions and to familiarize himself with these buildings.

We also use tactical surveys which allow the firefighter (while on duty) to go out and investigate on-site areas in his district and become familiar with yards, refineries, normal buildings, fences—whatever hazard he might find in his district. And we use preplans where firefighters will go out and gather information on an industry that could be a hazard, draw up a schematic plan and list the potential hazards and the available agencies we can use if we are confronted with an incident. We can also use these plans as training programs within the station for people who do not normally have the opportunity to tour these buildings. Seeing the layout on a plan gives them an idea of what they might be confronted with.

Although this training can be helpful to an emergency crew and enable it to be aware of materials normally kept in commercial and industrial buildings, it is usually the abnormal and the unexpected that create the greatest hazards for emergency crews. Every day thousands of tons of hazardous materials pass through a city. They pass through in different mediums; they come through by car and truck, rail, ship, air and by pipeline. These things are of concern to us because we do not know what is coming through. By preplanning for the unexpected, the fire department in Hamilton is well prepared to cope with any event. We conduct mock disasters, simulated emergencies, and scenarios.

Even though our equipment is state-of-the-art and the training in Hamilton is second to none, accidents do happen as a result of human error or mechanical error. Under rescue and emergencies conditions, we could be exposed to hazardous materials which include carbon-dioxide, carbon-monoxide, sulphur dioxide, nitrous oxide, and normal by-products that you can find right in this room such as nitrous oxide and carbon-dioxide. We are also confronted with leaks from different materials—ammonia, freon from refrigeration systems, natural gas—these products are hazardous to our respiratory system so we protect ourselves by wearing breathing apparatus. You are all familiar with the yellow bottles that we have on our backs and the gas masks we wear on our faces. These are the protections that allow us to enter a hazardous environment.

Many materials in their normal state are not considered a hazard, but when they are in large quantity or mixed with other materials or heat from a fire, they become hazardous and dangerous not only to human life but to the environment in general. A prime example of this is an everyday item—the car tire. I am sure most people are aware of what happened in Hagersville not too long ago. In any emergency situation, it is of the utmost importance to us that we properly identify the material we are dealing with. If we fail to do this, we are creating a greater hazard and a bigger problem. Normally you will see us using water, but by improperly using water we can create a greater hazard from a run-off of a material into the environment or create a more unstable product or a product that does react with water. We have to take these things into consideration. The run-off that could affect the environment can create a bigger area of concern. Water when mixed with chlorine at home makes a good laundry product but when you mix water and chlorine in improper proportions this



creates hydrochloric acid. Now instead of a normal product, we have a different product to contend with. We must know what the product is that we are involved with, and we must know if it is radioactive, if it is explosive, or if it is reactive with water or other chemicals. We have to know if things react with air. It sounds innocent enough but there are products that, when exposed to air, become flammable, combustible, and even explosive. They produce smoke, but that's not all--there are other chemicals and byproducts that we must be aware of. We must know how much material is involved in what we are dealing with. Can it be contained, can we dike it, can we keep it within confines, is it the result of a leak, is our problem a leaking tank and can we contain that leak, must we evacuate and--this is usually the biggest concern of all--is life at hazard?

These are the things we ask ourselves no matter what kind of call we go to, whether it is a garbage can fire or a major house fire or a building fire. We ask ourselves these questions and cannot always get the answers when we are confronted by waste. You look at waste and in your industry you know what that waste is; in our profession we do not always know what that waste is. We might use any available resource of different agencies or government Ministries, such as the Ministry of Environment, Medical Officer of Health, the Weather Office. We also use professionals that we deal with whether it is in the oil industry, hospitals or whatever. We use communications; our own communications setup or communication people in the media.

We have chemical handbooks, and emergency books that we carry around with us that give a quick insight into what we are dealing with if we know the material. We are trained to identify materials by the carrier--by the shape of the carrier, by the colour of the carrier and by the method of the carrier. We may tell what is in a cylinder by the shape and colour--whether it is oxygen or acetylene. Colour coding on pipelines is a great help to us--we know if its oxygen or a gas that is going through. Trucks can be identified by different shapes--a normal cargo carrier, flatbed, box truck. Cylinders are different and we try to identify if the contents are pressurized, reactive, chemical, acidic or corrosive. We look for the labels or the placards on trucks, on cartons or on the containers that they come in. But when we are dealing with waste materials, these things are not always identified. You do not have an identity tag on an industrial disposal container or on a garbage can. Here again we are dealing with the unknown.

We are also concerned with carelessly discarded waste or illegal dumping. We wonder if these things are going to cause a problem with the environment or a problem with lives. We want to know if the material is toxic or biologically dangerous. Proper care in identification of products and waste makes our job easier whenever we are confronted with an incident.

Another concern we have is exposure and long term effects from exposure from an incident that might have happened some time ago. In your profession you are aware of what you deal with every day. What we deal with today might not have an effect for several months or maybe for several years. There are on-going studies about this and even in our own department there are studies being done. Over the years, we have lost three firefighters who suffered from a liver problem. We have another couple who are undergoing treatments for liver problems. We are trying to associate this to a specific incident in which they were exposed some years ago. There are even cases where exposure of a material by an individual has caused effects not only to himself but to his children as well; the kids are suffering from a similar disease.

Even an innocent-looking hardware store contains materials that have the potential of a bomb--aerosol cans, paint, propane cylinders, insecticides, pesticides, plastics, acids--these are all household products that can be found in any house and in any garbage can. And they are not labelled.

Because of potentially hazardous materials, the Hamilton Fire Department has established a Hazardous Material Response Team--a group of on-duty firefighters who are equipped and trained to handle hazardous materials. They are equipped with specialized clothing that protects them from chemical leaks in most environments that they may enter into. They carry a variety of clothing and are equipped to handle leaks, to communicate, to



decontaminate, and to contain and form a restrictive barrier for some leaks. The team also has a hazardous-response vehicle which is equipped with communications, maps, preplans, a list of agencies that we can refer to in the event of a problem, and specialized clothing. As well, we call upon assistance from carriers and trucking agencies that carry hazardous material. They offer a wealth of information by identifying the material and how to cope with it.

We have access to many of the suppliers of different materials and the manufacturers. We may also use an agency called "TEAP." "TEAP" is a transportation emergency assistance program that has been set up to help the agencies in the event of a major problem. We can use them for both physical assistance and advice on the job.

Our resource material is vast and it includes both people and equipment, not only the people in the fire department, but also people in other emergency agencies. We not only have our own equipment which is state-of-the-art, but we can call upon local fire departments for assistance. We have libraries of knowledge accessible both within our own apparatus and outside through our communications systems. We have the training and experience; Hamilton has one of the best departments in North America. Hopefully we can combat anything we are confronted with, but I want to stress that our job is made easier if we can identify the product.

This is where we depend upon legislation and regulations and you people doing your job to identify whatever waste we are confronted with so we can deal with it to protect our people as well as the environment and your people. We also depend upon frequent training and prayer. Thank you.

QUESTIONS AND DISCUSSION

Lillian Vine

Thank you very much Doug. I do hope one of those resources you use is the Canadian Centre for Occupational Health and Safety.

One common thread is training. It was emphasized all the way through this seminar, whether in hospitals or fire departments, oil recycling or waste management, training and more training is what is needed. People have to know what they work with, they have to know how to do the job.

Anne Monteath - Sick Children's Hospital, Toronto

A question for Richard. During your presentation, you mentioned that you have a large research facility. We too have that same kind of thing which generates not only separate categories of waste but combinations of waste that we have great difficulty in getting rid of. How do you deal with these things?

Richard Blais

We include them as part of the overall complex as far as waste management goes. If it is a chemical they get the same manual and the same training; if it is a toxic substance then it would go through the toxic waste training.

If it is chemical waste then it would go through with the chemical stream and if it is considered possibly biological then it would have to go the other way.



Bernadette Stringer

In Ontario there has been an attempt to look at the whole issue of recycling. For example, pediatric wards in hospitals are discontinuing the use of disposable diapers. That is one way of dealing with some of the waste that is generated there. One of the reasons we went to disposables in the health care industry was because of the labour-intensive nature of the work in preparing things for sterilization.

Dave McNeaney

I have a question for Fred. Are your oils for sale? Do you have people come around to plants and sell oils?

Fred Rehn

You are probably using our oil now and are not even aware of it. Our oil is sold under the Performance Plus brand, and also under the Green Line label from President's Choice, and under many other generic labels.

Dave McNeaney

Is it made clear that they are recycled oils?

Fred Rehn

Some of them do and some of them don't. For marketing purposes the Green Line very proudly says right up front that the product is recycled. As we become more and more environmentally aware, we expect in the near future a legislated requirement that all lubricating oils contain a percentage of recycled product. This will become reality within the next couple of years and will be very good for companies like ours. Up to now, a lot of our products have had a stigma attached to them because they were recycled but that is changing and we are now able to step out of the closet.

Dave McNeaney

I don't know much about the recycling. Is it as good as standard, high performance oil? Does it break down faster once it has been recycled? All oils do break down and they do have contaminants.

Fred Rehn

An oil is only as good as its additive package. The base oil is recyclable indefinitely. It can be used over and over and over as long as the contaminants are removed. We add additive packages to give it water-emulsifying properties or better lubricating qualities. Different products, like motor oil, chain oil and hydraulic oil all have different properties and the additive packages have to be adjusted accordingly.

Bruce Silvester - Ministry of Government Services

I have a question for Fred. You say you have a lab on site. How long does it take to have that lab run an analysis on a truck load that shows up at your gate.



Fred Rehn

It depends on how busy the lab is. We run analyses for not only every load that comes on site, but at various stages throughout the recycling process. We also analyze for a lot of external clientele including the government.

Bruce Silvester

How long would it take to run tests for PCB contaminants in oils?

Fred Rehn

This is only a guess, but I would say about half an hour provided that the staff is available.

Bruce Silvester

I would like to have access to your lab if you can run it through in half an hour. We wait weeks for an analysis.

Fred Rehn

We don't have anything that long. We have very sophisticated lab equipment.

Nadia Hawkins

I have a comment to offer the audience. Mr Johnstone mentioned several times that a big problem he and his workers face is the lack of labelling on many of the waste products. I would like to offer this bit of information that the recommendations have been given to the federal government to have WHMIS applied to hazardous waste. We are expecting a decision on that in early 1992. We don't know what the details will be but it is to address part of your problem and the increase in recycling industries. We are really looking forward to that decision.



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